FIG.1

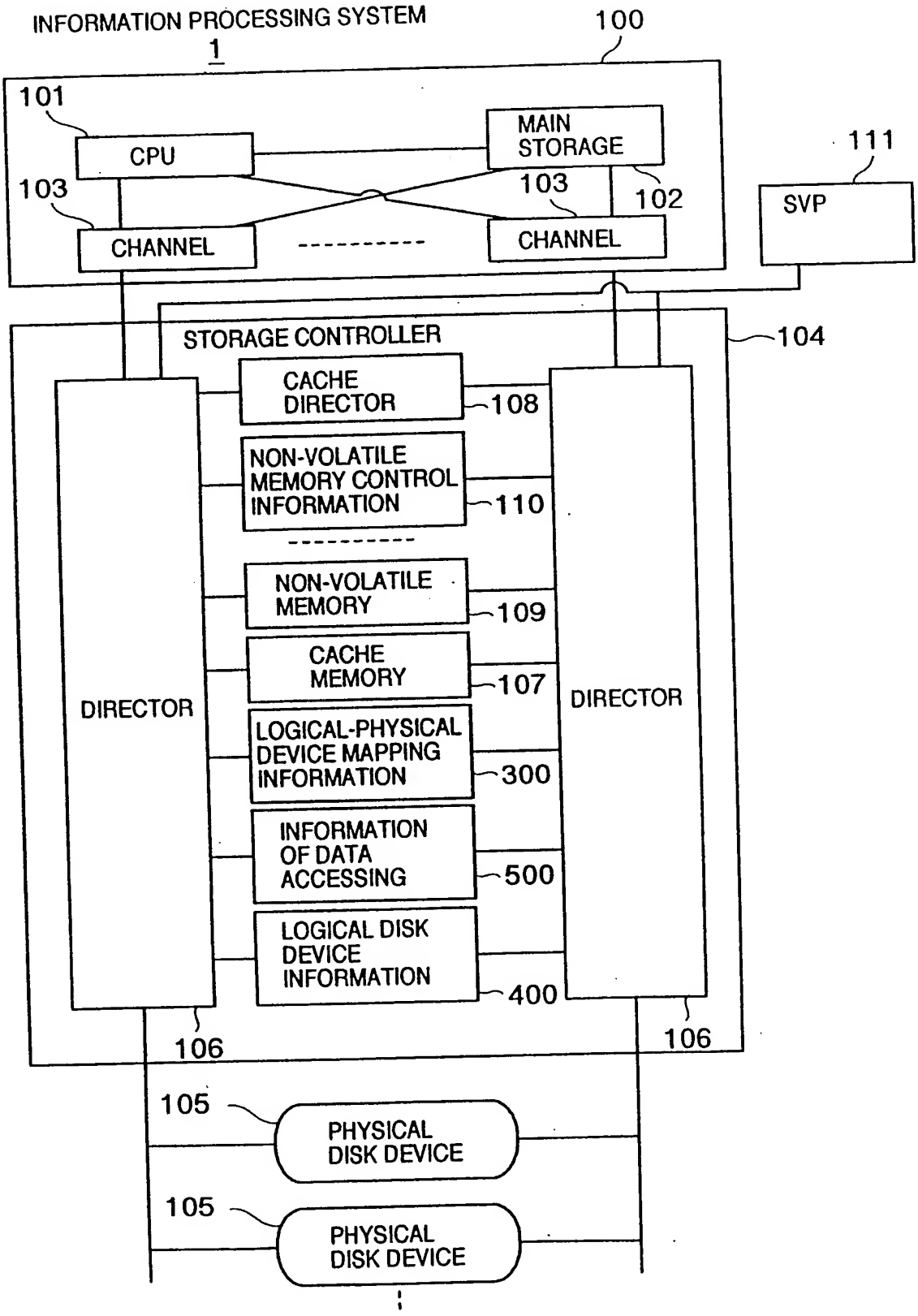

INFORMATION PROCESSING SYSTEM
1
100
101
CPU
MAIN STORAGE
103
102
103
CHANNEL
CHANNEL
111
SVP
STORAGE CONTROLLER
104
CACHE DIRECTOR
108
NON-VOLATILE MEMORY CONTROL INFORMATION
110
NON-VOLATILE MEMORY
109
CACHE MEMORY
107
LOGICAL-PHYSICAL DEVICE MAPPING INFORMATION
300
INFORMATION OF DATA ACCESSING
500
LOGICAL DISK DEVICE INFORMATION
400
DIRECTOR
DIRECTOR
106
106
105
PHYSICAL DISK DEVICE
105
PHYSICAL DISK DEVICE

FIG.2

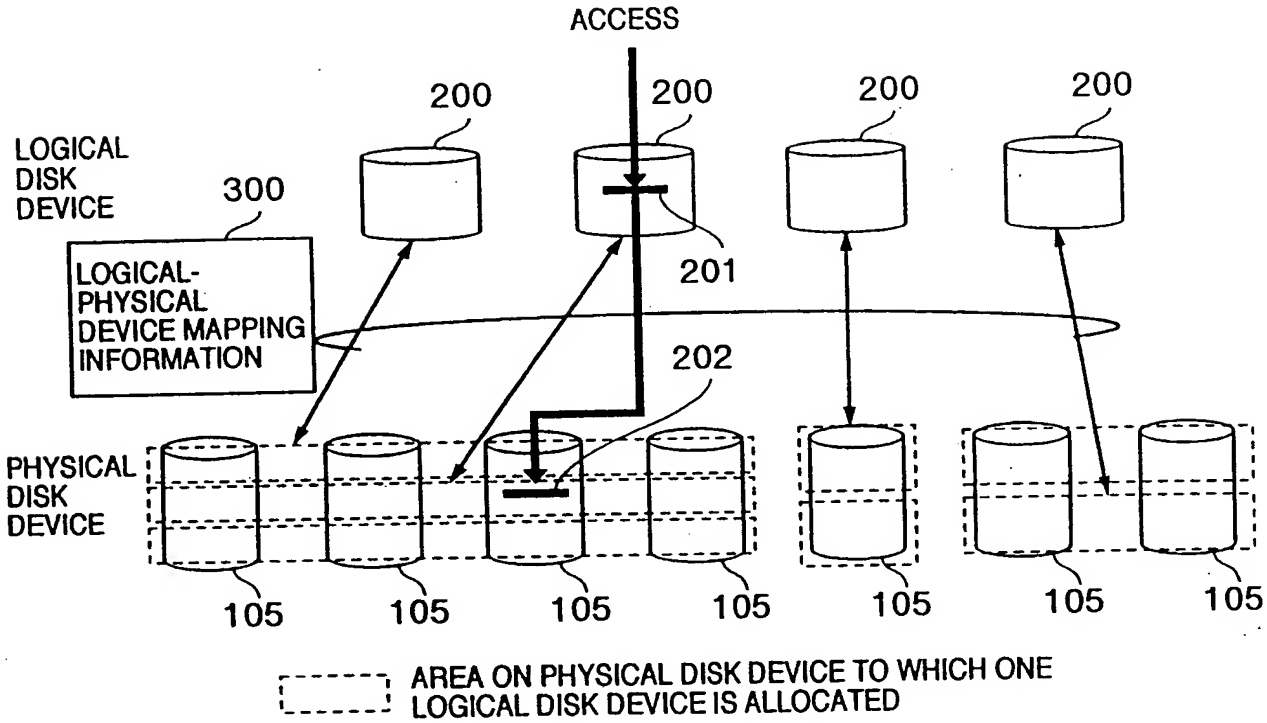

ACCESS
200
200
200
200
LOGICAL DISK DEVICE
300
LOGICAL-PHYSICAL DEVICE MAPPING INFORMATION
201
202
PHYSICAL DISK DEVICE
105
105
105
105
105
105
105
AREA ON PHYSICAL DISK DEVICE TO WHICH ONE LOGICAL DISK DEVICE IS ALLOCATED

FIG.3

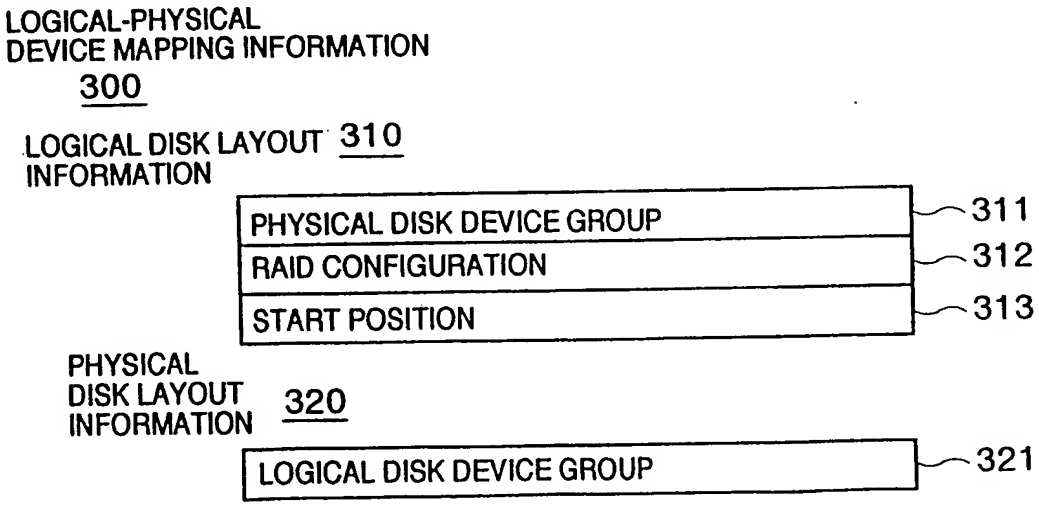

LOGICAL-PHYSICAL DEVICE MAPPING INFORMATION
300
LOGICAL DISK LAYOUT INFORMATION 310
PHYSICAL DISK DEVICE GROUP
311
RAID CONFIGURATION
312
START POSITION
313
PHYSICAL DISK LAYOUT INFORMATION 320
LOGICAL DISK DEVICE GROUP
321

FIG.4

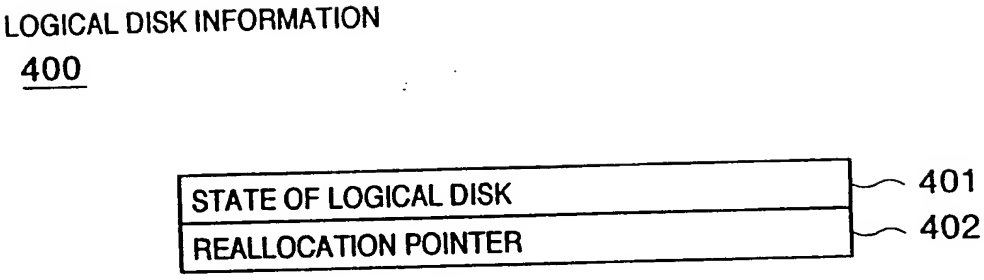

LOGICAL DISK INFORMATION
400
STATE OF LOGICAL DISK
REALLOCATION POINTER
401
402

FIG.5

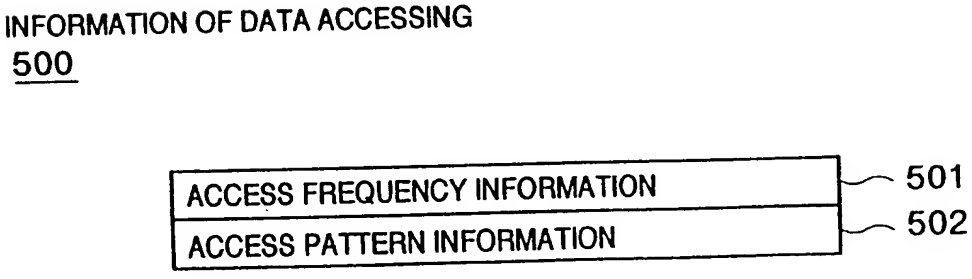

INFORMATION OF DATA ACCESSING
500
ACCESS FREQUENCY INFORMATION
ACCESS PATTERN INFORMATION
501
502

FIG.6

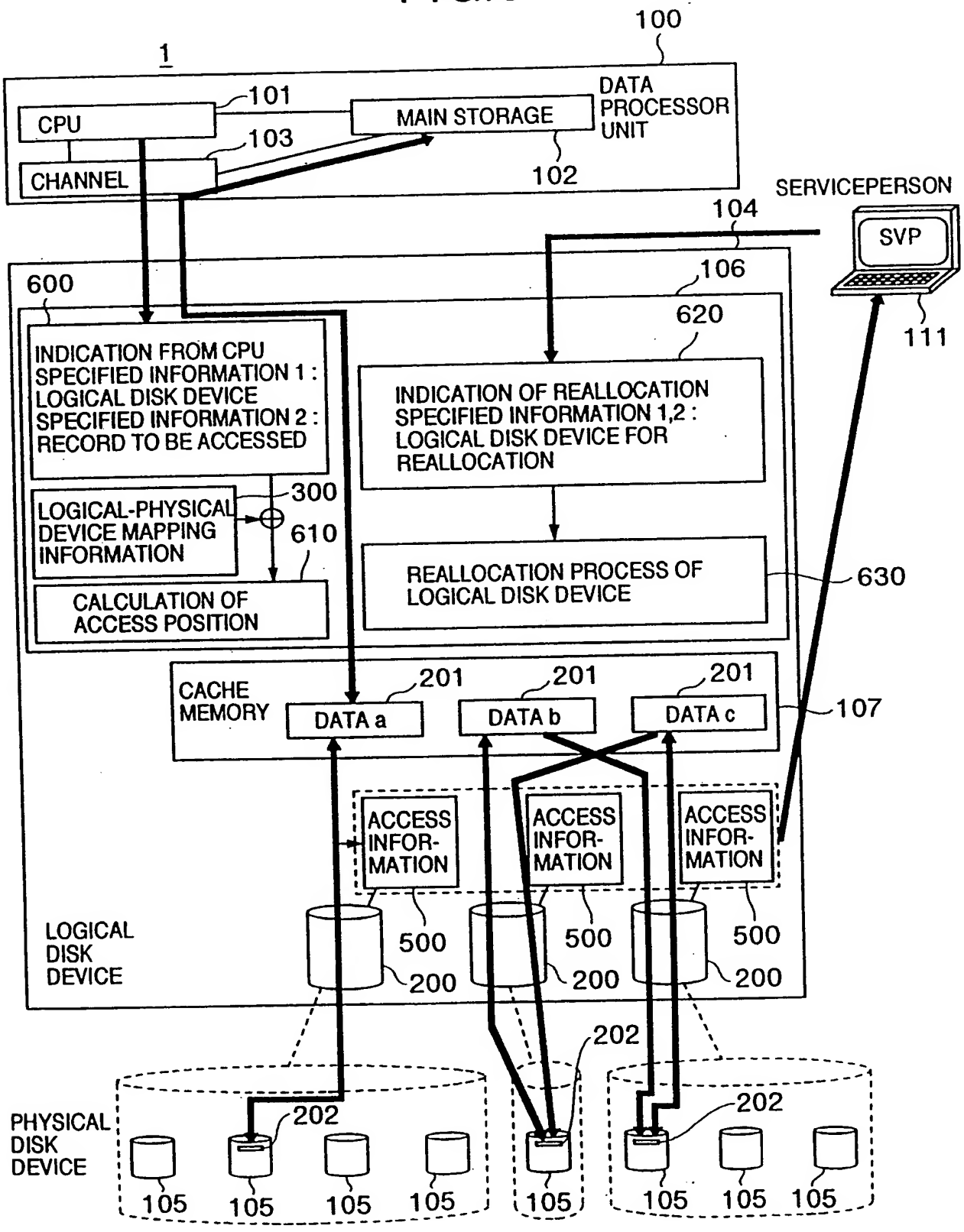

100
1
101
CPU
MAIN STORAGE
DATA PROCESSOR UNIT
103
CHANNEL
102
SERVICEPERSON
104
SVP
111
600
106
620
INDICATION FROM CPU SPECIFIED INFORMATION 1 : LOGICAL DISK DEVICE SPECIFIED INFORMATION 2 : RECORD TO BE ACCESSED
INDICATION OF REALLOCATION SPECIFIED INFORMATION 1,2 : LOGICAL DISK DEVICE FOR REALLOCATION
300
LOGICAL-PHYSICAL DEVICE MAPPING INFORMATION
610
CALCULATION OF ACCESS POSITION
REALLOCATION PROCESS OF LOGICAL DISK DEVICE
630
CACHE MEMORY
201
DATA a
201
DATA b
201
DATA c
107
ACCESS INFOR-MATION
ACCESS INFOR-MATION
ACCESS INFOR-MATION
LOGICAL DISK DEVICE
500
200
500
200
500
200
202
202
202
PHYSICAL DISK DEVICE
105
105
105
105
105
105
105
105

FIG.7

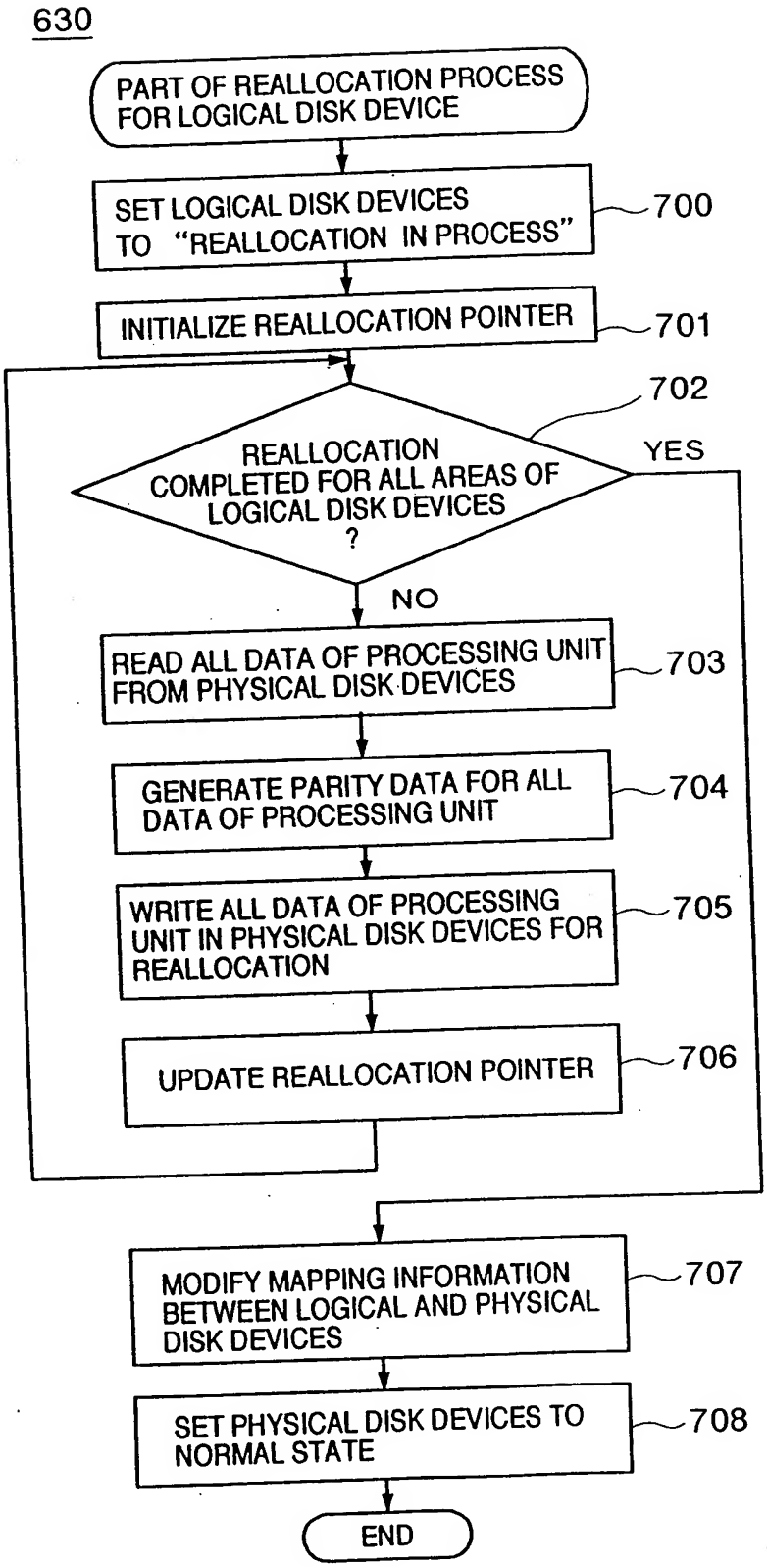

630
PART OF REALLOCATION PROCESS FOR LOGICAL DISK DEVICE
SET LOGICAL DISK DEVICES TO "REALLOCATION IN PROCESS"
700
INITIALIZE REALLOCATION POINTER
701
REALLOCATION COMPLETED FOR ALL AREAS OF LOGICAL DISK DEVICES ?
702
YES
NO
READ ALL DATA OF PROCESSING UNIT FROM PHYSICAL DISK DEVICES
703
GENERATE PARITY DATA FOR ALL DATA OF PROCESSING UNIT
704
WRITE ALL DATA OF PROCESSING UNIT IN PHYSICAL DISK DEVICES FOR REALLOCATION
705
UPDATE REALLOCATION POINTER
706
MODIFY MAPPING INFORMATION BETWEEN LOGICAL AND PHYSICAL DISK DEVICES
707
SET PHYSICAL DISK DEVICES TO NORMAL STATE
708
END

FIG.8

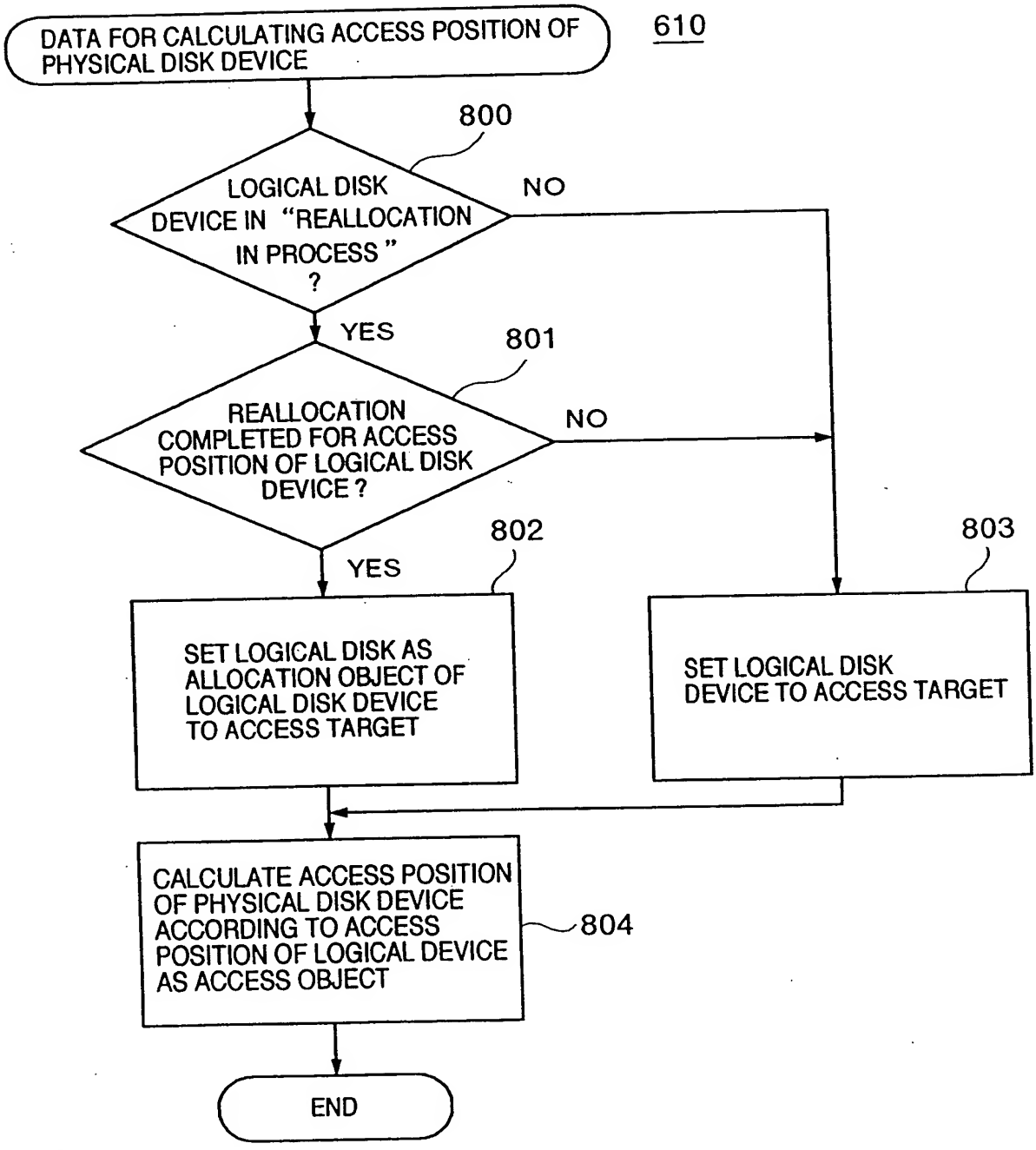

DATA FOR CALCULATING ACCESS POSITION OF PHYSICAL DISK DEVICE
610
800
LOGICAL DISK DEVICE IN "REALLOCATION IN PROCESS" ?
NO
YES
801
REALLOCATION COMPLETED FOR ACCESS POSITION OF LOGICAL DISK DEVICE ?
NO
YES
802
803
SET LOGICAL DISK AS ALLOCATION OBJECT OF LOGICAL DISK DEVICE TO ACCESS TARGET
SET LOGICAL DISK DEVICE TO ACCESS TARGET
CALCULATE ACCESS POSITION OF PHYSICAL DISK DEVICE ACCORDING TO ACCESS POSITION OF LOGICAL DEVICE AS ACCESS OBJECT
804
END

FIG.9

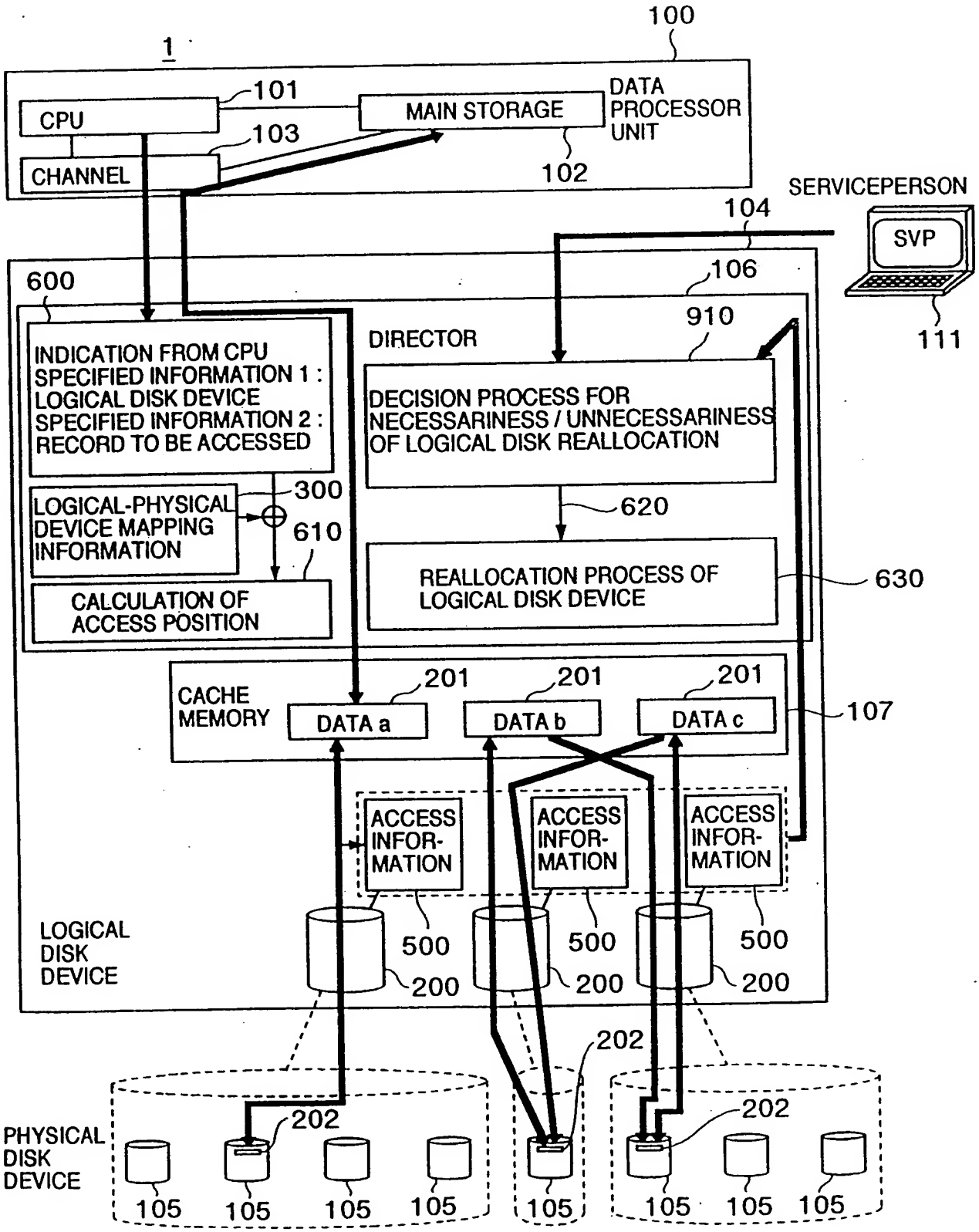
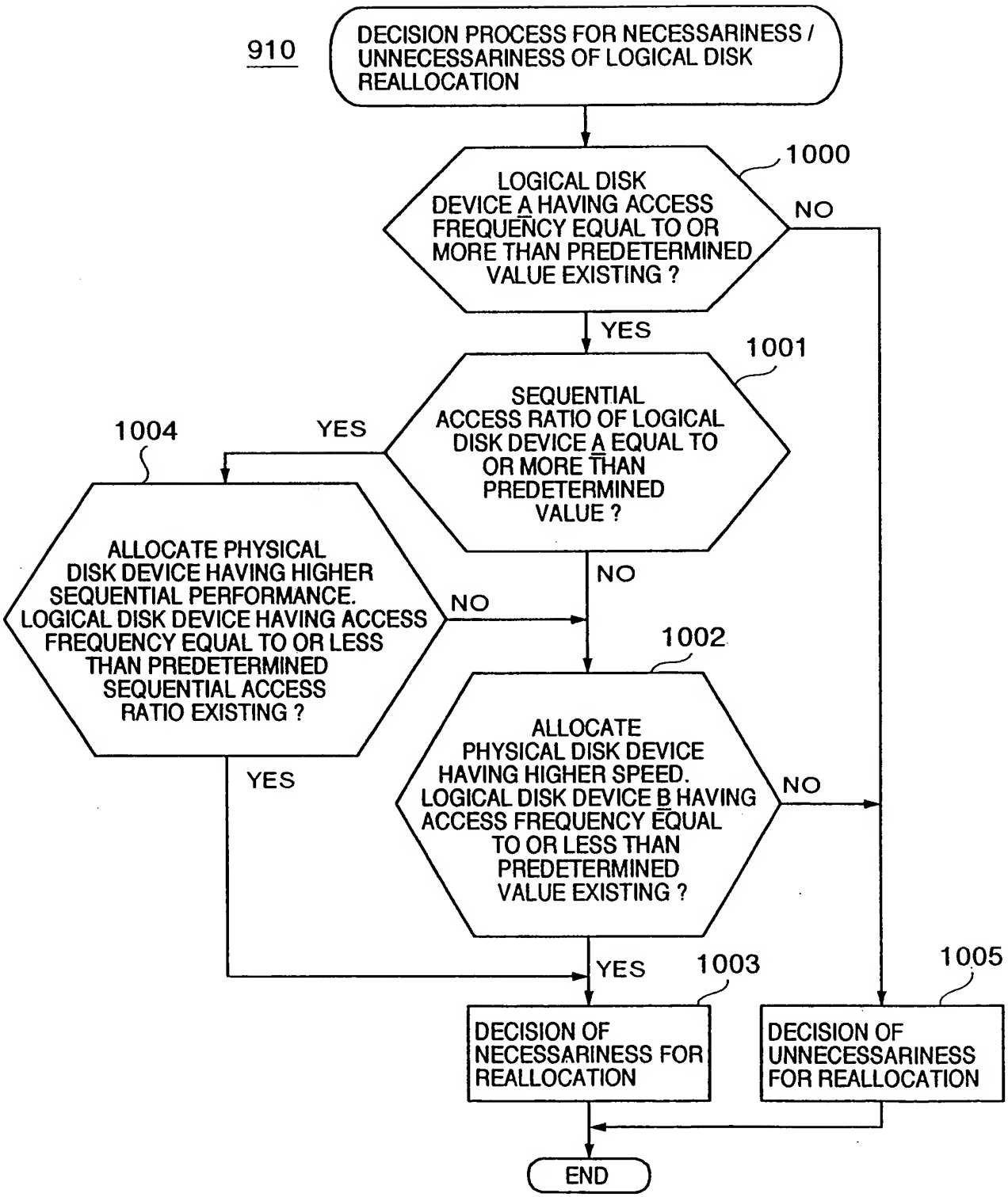

100
1
101
CPU
MAIN STORAGE
DATA PROCESSOR UNIT
103
CHANNEL
102
SERVICEPERSON
104
SVP
111
600
106
910
DIRECTOR
INDICATION FROM CPU
SPECIFIED INFORMATION 1 : LOGICAL DISK DEVICE
SPECIFIED INFORMATION 2 : RECORD TO BE ACCESSED
DECISION PROCESS FOR NECESSARINESS / UNNECESSARINESS OF LOGICAL DISK REALLOCATION
LOGICAL-PHYSICAL DEVICE MAPPING INFORMATION
300
610
620
REALLOCATION PROCESS OF LOGICAL DISK DEVICE
630
CALCULATION OF ACCESS POSITION
CACHE MEMORY
201
201
201
DATA a
DATA b
DATA c
107
ACCESS INFOR-MATION
ACCESS INFOR-MATION
ACCESS INFOR-MATION
LOGICAL DISK DEVICE
500
500
500
200
200
200
202
202
PHYSICAL DISK DEVICE
105
105
105
105
105
105
105
105

FIG.10


910
DECISION PROCESS FOR NECESSARINESS / UNNECESSARINESS OF LOGICAL DISK REALLOCATION
1000
LOGICAL DISK DEVICE A HAVING ACCESS FREQUENCY EQUAL TO OR MORE THAN PREDETERMINED VALUE EXISTING ?
NO
YES
1001
SEQUENTIAL ACCESS RATIO OF LOGICAL DISK DEVICE A EQUAL TO OR MORE THAN PREDETERMINED VALUE ?
YES
1004
ALLOCATE PHYSICAL DISK DEVICE HAVING HIGHER SEQUENTIAL PERFORMANCE. LOGICAL DISK DEVICE HAVING ACCESS FREQUENCY EQUAL TO OR LESS THAN PREDETERMINED SEQUENTIAL ACCESS RATIO EXISTING ?
NO
NO
1002
ALLOCATE PHYSICAL DISK DEVICE HAVING HIGHER SPEED. LOGICAL DISK DEVICE B HAVING ACCESS FREQUENCY EQUAL TO OR LESS THAN PREDETERMINED VALUE EXISTING ?
NO
YES
YES
1003
DECISION OF NECESSARINESS FOR REALLOCATION
1005
DECISION OF UNNECESSARINESS FOR REALLOCATION
END